



**Fig. S4 Activity and motion.** (A, B, C) Alignment of LFP (black),  $\text{Ca}^{2+}$  (green) and motion (blue) traces. The  $\text{Ca}^{2+}$  fluctuations have been averaged on the red regions displayed in the three panels. In panel A, the  $\text{Ca}^{2+}$  fluctuations are measured on the whole brain section. In panels B and C the  $\text{Ca}^{2+}$  fluctuations are measured on two different single neurons (red circles) that show motion-correlated activity. (D)  $\Delta F/F_0$  images showing specific temporal points (\*) of calcium traces in B and C.